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Calibrated Ages for Severe Medieval Droughts in California.

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Abstract

Relict stumps rooted in present–day lakes, marshes, and streams in California provide evidence of severe and prolonged droughts during Medieval time (Stine, 1994). To improve the calendar–year dating of these droughts, we have begun AMS ^{14}C dating sequences of tree–rings from these stumps. In an initial set of measurements, a 1220–1240AD ("1σ" confidence interval; 1210–1270AD 95% confidence) age–of–death was obtained by wriggle–matching eight ^{14}C dates obtained for sets of tree-rings from an individual stump that had lived for 170 years. Calibration of pairs of dates on innermost and outermost ring sets from two other stumps yielded calendar–year–of–death ages of 1210–1270AD and 1160–1170/1200–1280AD (1σ confidence intervals). For a fourth stump, inner/outermost ring set measurements yielded an age of death of 1490–1520AD (1σ confidence interval). The significance of the improved precision of the calendar year ages of death obtained by these methods for both establishing the regional extent and synchroneity of the droughts, and the correlation of the droughts with similar climate events around the globe, will be discussed briefly.

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